A Pilot Environmental Data Grid Distribution System

Gary Walter
Computer Scientist
U.S. EPA Office of Research and Development (ORD)/National Exposure Research Laboratory (NERL)/Atmospheric Modeling Division (AMD)/Model Evaluation and Application Research Branch (MEARB)
(919) 541-0573
walter.gary@epa.gov

Authors: Gary Walter[1], Alice Gilliland[1], Ellen Cooter[1], Robert Gilliam[1], Kevin Cavanaugh[2], Lynne Petterson[3]
[1]U.S. EPA ORD/NERL/AMD/MEARB
[2]U.S. EPA ORD/ORMA
[3]U.S. EPA ORD/NERL
Keywords: grid, data, distributed, subnet, climate

The poster will present the objectives and initial results of a pilot Data Grid distribution system conducted in collaboration between the U.S. Environmental Protection Agency (U.S. EPA) and the National Oceanic and Atmospheric Agency (NOAA). The primary objectives of this study are to implement, operate, and evaluate a workable, distributed data access, format neutral "data-on-demand" prototype, leveraging leading-edge technologies assembled in a unique operational prototype system and distributed over the U.S. EPA's Data Grid. The first phase of this pilot demonstrates the Data Grid distribution system. Ensuing phases of this system will develop multiple mechanisms for distributed data access, analysis, visualization, product generation, and sub-setting. The first datasets to be tested on this system are part of the ORD/NERL Climate Impact on Air Quality (CIRAQ) project.

CIRAQ Background (science driver)

Past research suggests that future climate may differ substantially from current conditions because of greenhouse gas effects on the radiation budget. As greenhouse gases increase, long-wave radiation can be trapped and cause higher temperatures within the troposphere. The exploration of possible responses to future climate conditions is addressed by ORD/NERL through the CIRAQ project. A principle goal of CIRAQ is to explore the uncertain nature of future air quality. Findings from these studies will provide background information to U.S. EPA Global Change Research Program (GCRP) scientists housed within the National Center for Environmental Assessment (NCEA). It is anticipated that approximately four terabytes of information will be generated from this effort that will be made available to select researchers through the password protected pilot system. Information distributed by the pilot system will include both regional climate runs and simulations for current climate.

This "Pilot Environmental Data Grid Distribution System" has three different components including a science-driver component, an infrastructure component, and the developed pilot system component. The poster will detail the results to date of the pilot system and how following phases of the project will leverage technologies that are being adopted in parallel to this effort including the U.S. EPA's Science Portal, Data Grid, and Science Subnet.

Disclaimer: The research presented here was performed under the Memorandum of Understanding between the U.S. Environmental Protection Agency (U.S. EPA) and the U.S. Department of Commerce's National Oceanic and Atmospheric Administration (NOAA) and under agreement number DW13921548. This work constitutes a contribution to the NOAA Air Quality Program. Although it has been reviewed by the U.S. EPA and NOAA and approved for publication, it does not necessarily reflect their policies or views.